INVENTION SUBMISSION FORM

⊙ Title of Invention:

WEB BROWSING AND TCP/IP SETUP TIME OPTIMIZATION, DATA RATE AND THROUGHPUT INCREASE IN A WIRELESS NETWORK

⊙ Name of Inventors, telephone, address and business unit:
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Mohamed Anisur Rahman

⊙ What problem does the invention solve or what purpose does it serve?
In most packet application using TCP, setup or round trip time is always associated with every TCP session. When the session is associated with wireless the frequent setup time due to burst assignment and link setup time (involves monitoring and reporting of radio environment etc.) throttles the throughput and data rate. In this invention the ways to reduce this setup time is described.

⊙ Explain your solution. Attach any sketches, lab notebook entries, TMs, etc. which help describe and illustrate the solution.
This Invention describes the way for data throughput and performance improvement in wireless Internet/Web and other packet data application where it is assumed that TCP/IP is used as the transport protocol.
The setup time or the round trip time can be reduced or minimized in a system that has simultaneous voice and data application. This due to the spurts in voice communication. In both PCS and Cellular CDMA supports secondary traffic in multiplex option 1 & 2. The setup information for the TCP should be
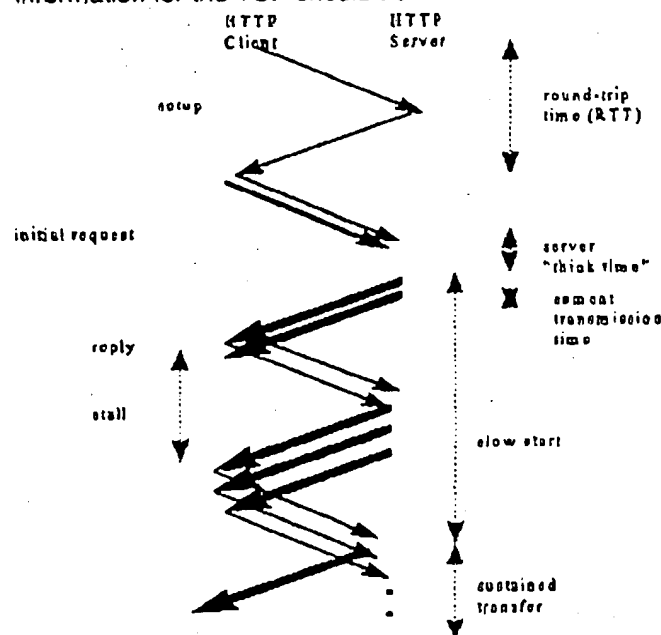

Fig. 1 Packets exchanged in an HTTP over TCP connection not limited by bandwidth. Bold arrows indicate data transfer, while thin arrows show SYN or ACK only packets.

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carried in the secondary traffic portion of the voice circuit frame. This will alleviate the frequent setup time (round trip time) issue associated with a TCP session, because you are using the circuit switched voice connection. And you do not have to use burst management / burst setup procedure and associated delay (radio link setup delay due to radio environment monitoring, reporting etc.. associated with link setup) for the set up part of TCP session. In this way the TCP setup time can be minimized and the data throughput can be considerably enhanced.

For this thing to work properly the SDU (Selection & Distribution Unit) has to do the function of mapping/loading the TCP setup information in the voice frame using the secondary traffic portion for this sort of setup data.

In the other applications where a simultaneous voice is not supported a separate circuit switched path may be utilized for the same purpose of setup time optimization for TCP. This also applicable for TDMA.

◉ Under what circumstances would it be economically advantageous for someone outside of Lucent to make, use or sell the invention?
This is the way to data throughput improvement in a packet environment where TCP is used as the transport protocol. it will bring a lot of revenue for the system/network operators.

◉ How easily could Lucent detect, or suspect, that someone was making, using or selling the invention?
Very easily.

◉ How easily can the invention be designed around? In other words, how easily can another designer achieve the same functionality with a different design and for roughly the same costs?
There is no way around.
Very difficult.

Dept. Head of Principal Inventor

John A. Marinho, Technology Director

Wireless Standards Development and Industry Relations

PATENT ONE PAGER: WEB BROWSING AND TCP/IP SETUP TIME OPTIMIZATION AND DATA THROUGHPUT INCREASE IN A WIRELESS NETWORK

Background:

The World Wide Web has rapidly become one of the most popular Internet services. Next-generation mobile communication system will be required to support web and various other packet services. Web access based on HTTP is request-response oriented with bursts of numerous requests and small, unidirectional responses. Frequent connection setup and tear-down is a problem specially for the mobile environment where a burst/call setup time may be in the extant of 280 ms or more, which in many case may far exceed the data burst time.

Retrieval of a complete web page requires separate requests for text and each embedded image thus making traffic inherently bursty.

These mismatches between the needs of HTTP and the service provided by TCP in a wireless environment contribute to increased latency for most web users (due to setup, ACK. Etc.). The wireless data throughput in such a scenario will be far below supported data rate assuming TCP/IP protocol will be used.

Unfortunately, TCP is poorly suited to frequent, short, request-response- style traffic. We cannot solve the inherent slow -start problem of TCP.

There is a need for increasing the data throughput and performance improvement in a third generation wireless data packet network for these sort of web and other application where TCP/IP is used.. Decreasing the round trip time in a TCP session will decrease its effect on the user data rate.

Benefit for Lucent

There is no existing solution that incorporates this. There may be multiple advantages for Lucent to pursue this. If Lucent has this patent then it may have considerable leverage on the development of Internet/Web and other services. This will improve the data rate in this sort of application and improved performance.

Summary of invention

This invention describes the way for data throughput and performance improvement in wireless Internet/Web and other packet data application where it is assumed that TCP/IP is used as the transport protocol.

In most packet application using TCP setup or round trip time is always associated with every TCP session. When the session is associated with wireless the frequent setup time due to burst assignment and link setup time (involves monitoring and reporting of radio environment etc.) throttles the throughput and data rate. In this invention the ways to reduce this setup time is described.

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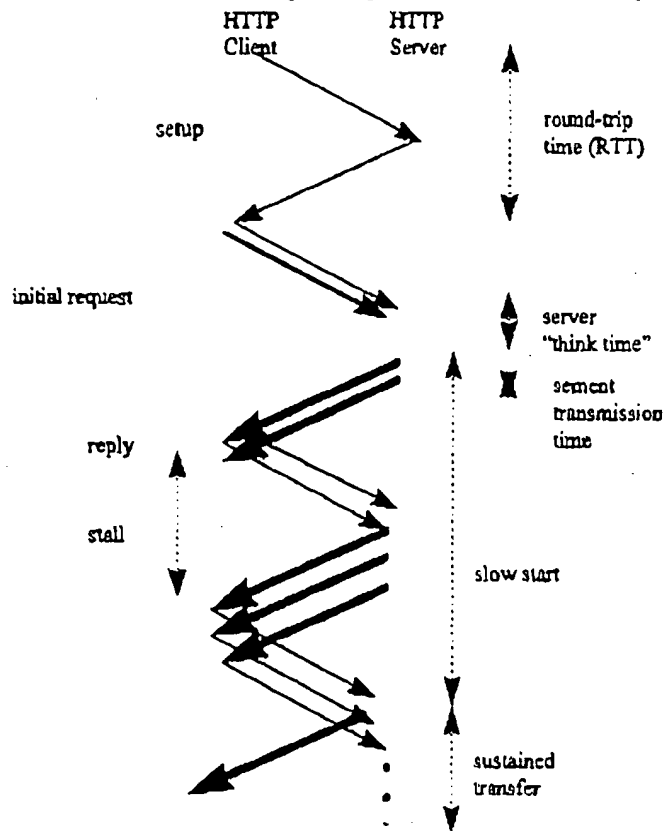

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Claims

Inventors
Mohamed Anisur Rahman

Applicable System

Standard blocking Patent

Product Applicability

Planned for use in Project
?

Feasibility to detect Possible infringement
High

Suggested internal reference for prior art
None identified

Document needed to avoid internal infringement
None identified

Public Disclosure of invention, data and place
no public disclosure